

Airborne noise reduction

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Airborne sound insulation

The R_w -Values of building elements concern only the sound which is transferred through these particular elements e.g. the window. The "flanking" noise which is transferred through adjacent areas, e.g. the side walls, floors, ceilings etc are not taken into consideration. Composite elements, such as external facades of buildings, one needs to look at the resulting acoustic insulation value $R'_{w,res}$, which is composed of the R_w values of the individual components. The inverted comma indicates that this value also takes account of the flanking noise through the joints, interfaces and roller-shutters etc...

Requirements for sound insulation of building elements with respect to noise level and use

The minimum requirements for sound insulation of building elements in Austria are defined in ÖNORM B 8115-2 „Sound insulation and room acoustics in buildings “. Local regulations will apply.

Important: The requirement of the whole window and not the glass alone is defined!

Typically, the sound insulation requirements of the glazing are always higher than the value for the window. It is the duty of the Architect or acoustic consultant to determine the noise level and set the requirement for sound insulation.

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The measurement of acoustic insulation of glass alone is carried out in accordance with Austrian Standard ÖNORM EN ISO 140-3. The evaluation of results is carried out to ISO 717-1.

Austrian Standard ÖNORM EN 12758 „Glass and airborne sound insulation – Definition of characteristics“ gives nominal values for differing glass combinations. CLIMAPLUS ACOUSTIC or CLIMAPLUS SILENCE provide significantly better acoustic insulation values.

Whether the R_w -value of the window fulfils the requirement is to be tested according to Austrian Standard B 8115-4. This can be determined in a number of ways:

1. Measurement of the window in realistic (exact simulation) conditions.
2. Measurement of window samples with Standard sizes in a laboratory (EN 20140). In actual situations, however, differing installation details, unit size and aspect ratio have an effect on the sound insulation. It is possible for differences of up to 3 dB to be apparent between sound insulation in the test apparatus and in the final installation.
3. Nominal values for sound insulation in accordance with Austrian Standard B 8115-4, 5.3.4 for windows with conventional construction and typical glazing are shown in the following table. The Standard gives examples of applications and their values. From this it is possible to establish the calculated values $R_w + C_{tr}$. Acoustic testing in this case is not necessary.

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Nominal values acc. Austrian Standard ÖNORM B 8115-4, 5.3.4. for sound insulation of single windows with double glazing

Sheet thickness in mm	Evaluated Sound Insulation value R_w in dB and total of the Sound insulation value and spectrum-weighted value $R_w + C_{tr}$ in dB with cavity widths of					
	≤ 12 mm		≥ 15 mm			
	Double-Glazing		Double-Glazing		Double-Glazing with one laminated sheet	
	R_w	$R_w + C_{tr}$	R_w	$R_w + C_{tr}$	R_w	$R_w + C_{tr}$
4 + 4	31	26	33	28	--	--
4 + 6	33	28	35	30	--	--
4 + 8	34	29	36	31	38	33
4 + 10 (6 + 10) (6 + 8)	35	30	37	32	39	34

Nominal values acc. Austrian Standard ÖNORM B 8115-4, 5.3.4. for sound insulation of single windows with triple glazing

Number of sheets	Thickness of sheet in mm	Evaluated sound insulation value R_w in dB	total of the Sound insulation value and spectrum-weighted value $R_w + C_{tr}$ in dB
3 Sheets	4 or 5	35	30
2 Sheets	4 or 5	40	35
1 Sheet	10		